Department Of Fire Services

Massachusetts Firefighting Academy

Technical Rescue Programs

CONFINED SPACE RESCUE: TECHNICIAN LEVEL

STUDENT MANUAL

Reasons for the failure of Technical Rescue Operations

Acronym: FAILURE

F - Failure to understand or underestimating the environment

A- Additional medical implications not considered

I- Inadequate rescue skills

L- Lack of team work and experience

U- Understanding the logistical needs of the operation

R- Rescue versus recovery mode not considered

E- Equipment not mastered

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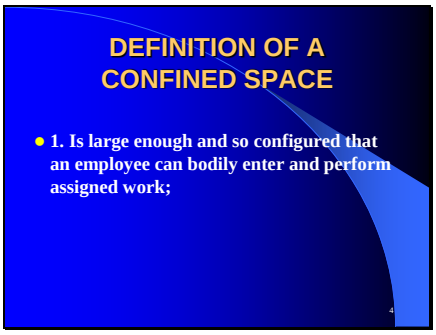

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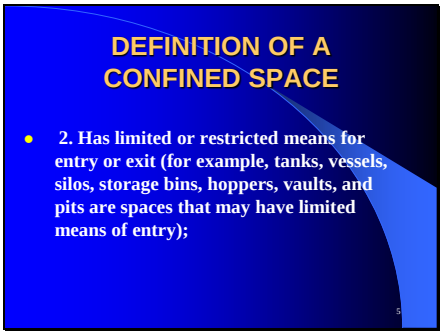

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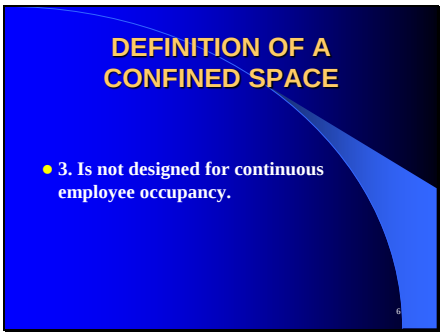

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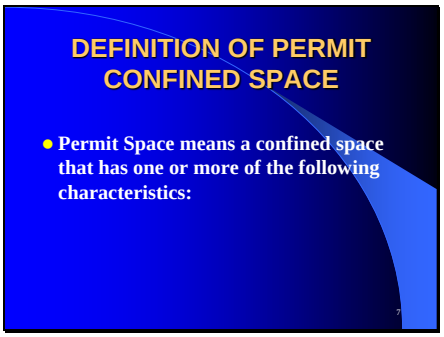

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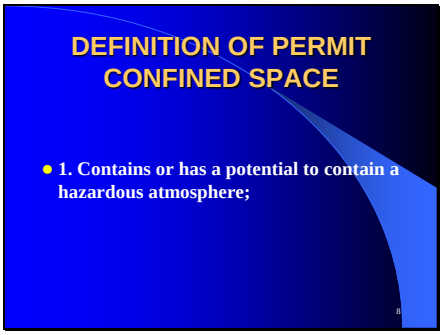

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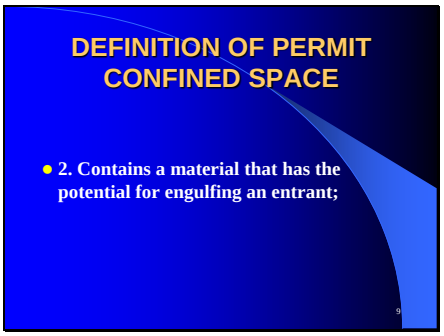

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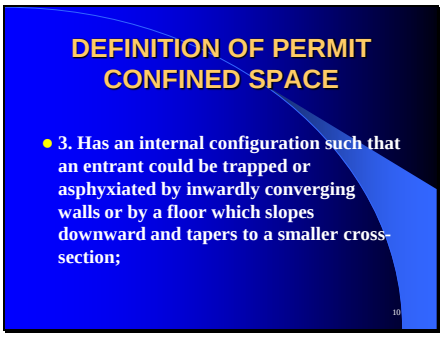

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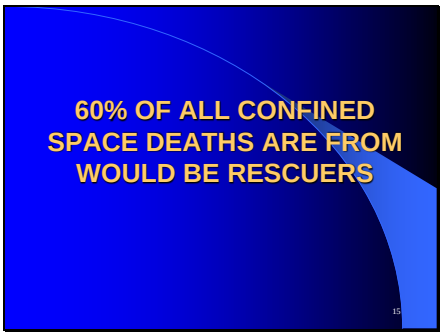

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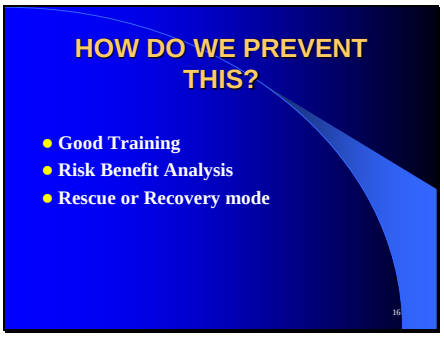

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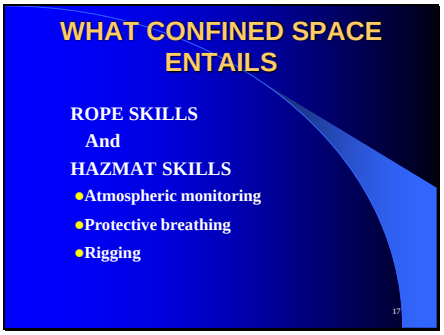

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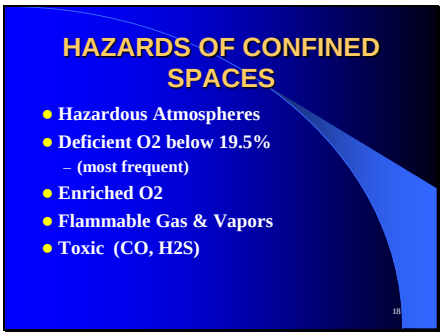

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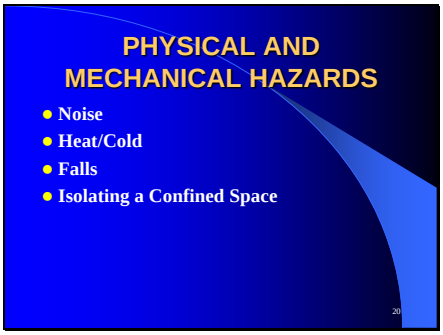

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OSHA 29 CFR 1910.146

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"Rescue Service"

- Defined as the personnel designated to rescue employees from permit spaces.

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WHO IS USUALLY LISTED AS THE RESCUE SERVICE?

USUALLY THE FIRE DEPARTMENT!

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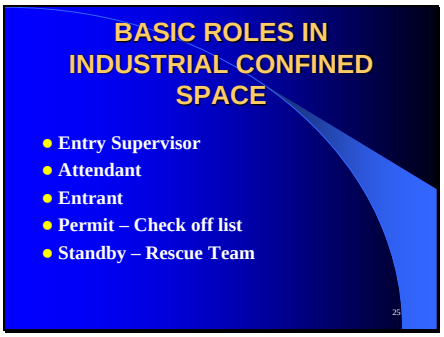

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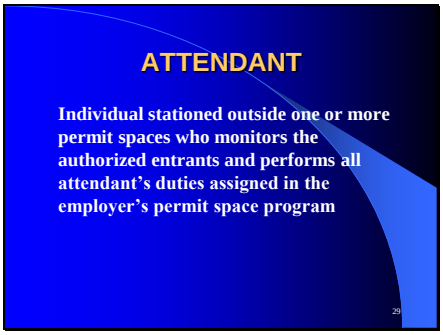

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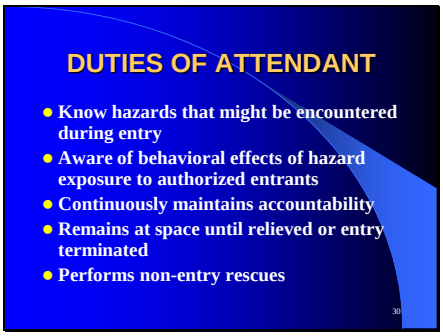

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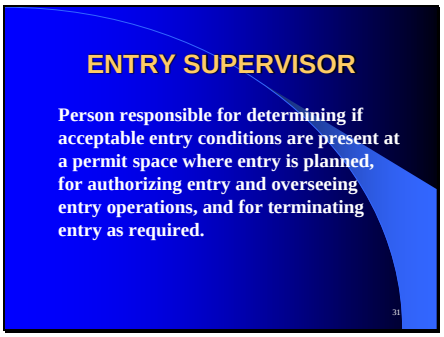

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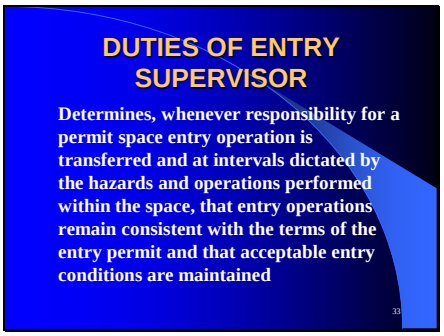

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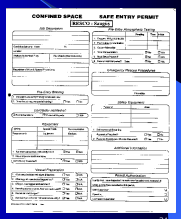
PERMIT SYSTEM

A permit signed by the entry supervisor and verifying that pre-entry preparations have been completed and that the space is safe to enter, must be posted at entrances or otherwise made available to entrants before they enter a permit space



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ENTRY PERMITS

MUST INCLUDE THE FOLLOWING INFORMATION:

- Name and signature of supervisor who authorizes entry;
- Name of permit space to be entered, authorized entrants, eligible attendants, and individuals authorized to be entry supervisors;
- Purpose of entry and know space hazards;
- Test results;
- Testers signature or initials

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ENTRY PERMITS

- Measures to be taken to isolate permit spaces and to eliminate or control space hazards(lockout/tagout, purging, inerting, flushing, and ventilation)
- Names and numbers of Rescue and EMS
- Date and duration of entry
- Communication equipment and procedures
- Additional permits
- Special equipment and PPE
- Any other info needed to ensure safety

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FIRE DEPARTMENT OPERATIONS

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FIRE DEPARTMENT PRE-PLAN

- Should include:
  - Locations
  - Hazards
  - Specific isolation methods
  - Accesses to the location of the entry opening
  - All types of entry openings
  - Internal configurations and special resource needs

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ATMOSPHERIC HAZARDS

- Oxygen deficient
- Oxygen enriched
- Flammable
- Toxic/Inert

- Consider the internal configuration of the space.

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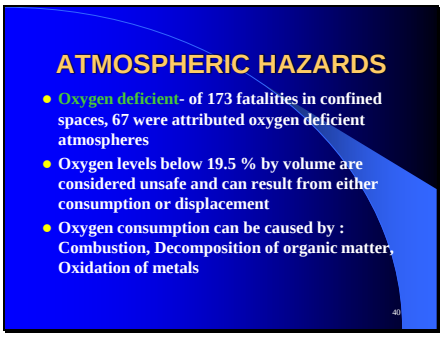

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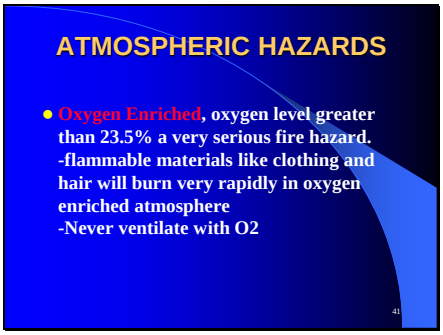

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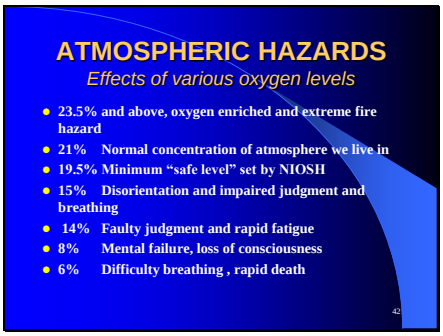

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ATMOSPHERIC HAZARDS

Flammable atmospheric hazards

For fire or explosion to occur three components must be present:

- A fuel *(such as a combustible gas)*
  - The specific mixture of fuel that will ignite or explode *(flammable range)* varies with each combustible gas
- Oxygen
- Ignition source

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FLAMMABLE RANGE

THE flammable range is the range between the LEL *(Lower Explosive Limit)* and UEL *(Upper Explosive Limit)*

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FLAMMABLE ATMOSPHERIC HAZARD

- **Flammable gas, vapor, or mist in excess of:**

  10% of its *Lower Explosive Limit*

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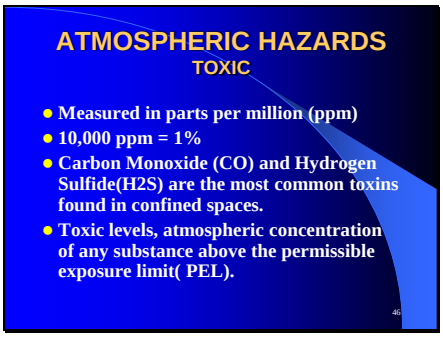

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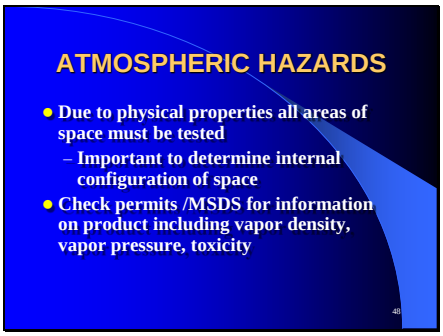

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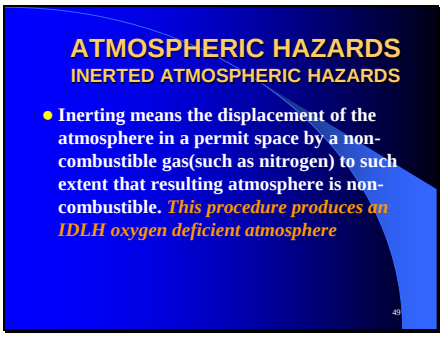

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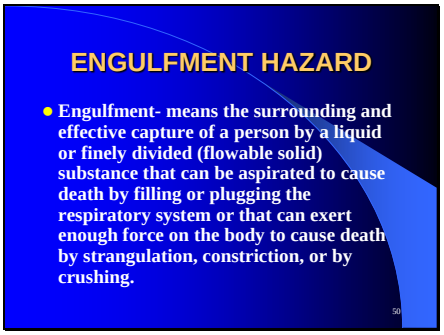

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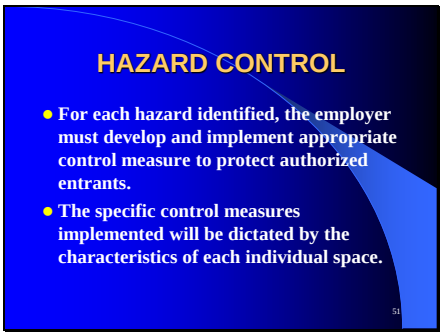

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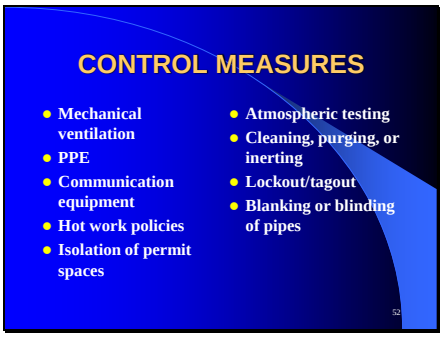

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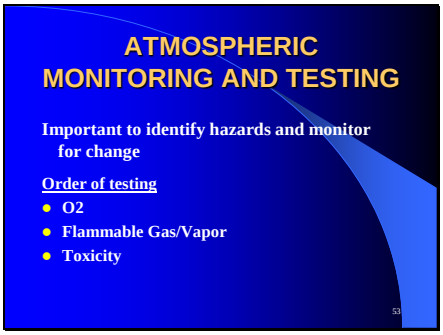

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BASIC EQUIPMENT

Atmospheric Monitoring

Respiratory Protection
- S.C.B.A.
- S.A.R.

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BASIC EQUIPMENT

- Retrieval Equipment
- Mechanical Advantage
- Class III Harness
- Consider
  - Vertical Lift
  - Horizontal Movement

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VENTILATION EQUIPMENT

- Is it needed?
- Positive or Negative?
- What will it do to the atmosphere?

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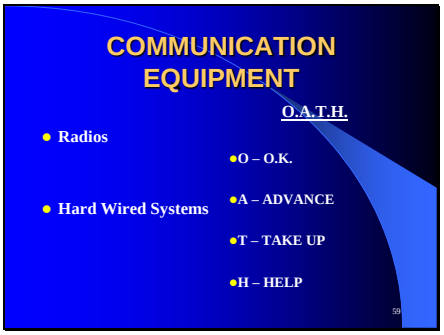

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PERSONAL PROTECTIVE EQUIPMENT

- Rescue Helmet
- Fire Rated Coveralls/Hood/Gloves
- Footwear
- Eye Protection
- Hearing Protection
- Class III Harness
- Communications and Lighting

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LIGHTS

- Intrinsically safe
- 3 Sources

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TRAINED AND ORGANIZED TEAM UNDER ICS

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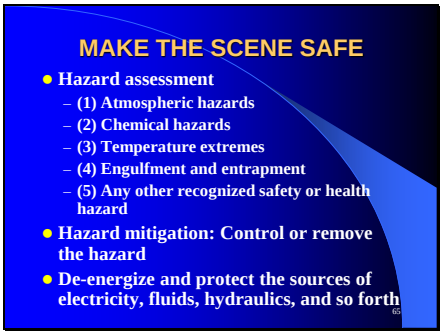

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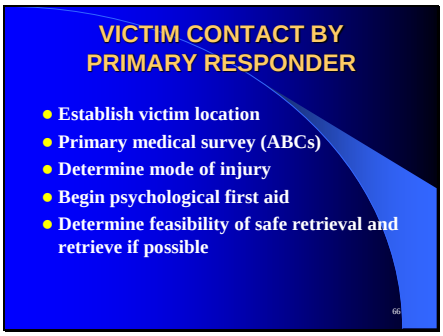

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SIZE UP

- Information gathering
- Resource identification
- Primary responder report
- Brainstorm strategy: risk/reward
- Incident management system (IMS)
- Team member assignments

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SIZE UP

- Distinction between rescue and recovery
- Scope and Magnitude
- Additional Resources
- Location and Number of Victims
- Risk Benefit Analysis
- Separation, isolation, interviewing, security of witnesses

- Hazards- utilities, mechanical, hazmat
- Access to Scene
- Environmental Factors

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RISK ASSESSMENT

- **Determines:**
  - "What" can occur,
  - "When" (how often) it is likely to occur,
  - "How" bad the effects could be.
- **Methods:**
  - Checklist
  - "What if ?" Scenarios

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RESCUE VS. RECOVERY

- Based on Risk/Benefit Analysis
- Duration of the operations
- Mechanism of Injury
- Environmental conditions
- Victim access

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PRINCIPLES OF RESCUE

- (Best) Self Rescue
  - Establish Communication With Victim
- (Next Best) Non entry rescue
- (Most Risky) Entry Rescue

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PREPARATION

- Rescuer personal protective equipment
- Anchoring and rigging rescue equipment
- Authorized entrant review

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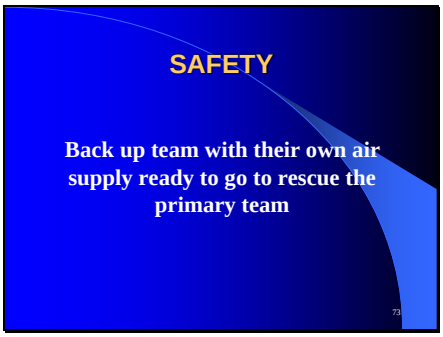

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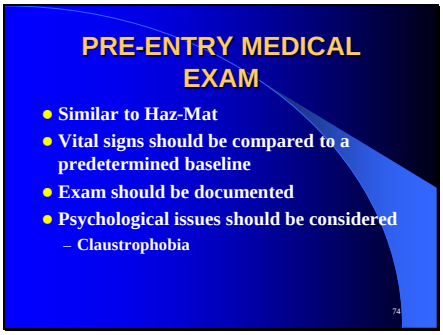

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ACCESS PATIENT

- Designate access team leader: one team leader for each group of two or more
- Utilize rescuer retrieval (high-point)
- Designate backup personnel

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STABILIZE AND PACKAGE THE PATIENT

- First aid to life-threatening injuries
- Secure packaging for rescue transport
- Plan for movement of victims and rescuers

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EVACUATE

- Move victim to a safe location
- Provide medical report to EMS
- Remove rescuers
- Emergency retrievals

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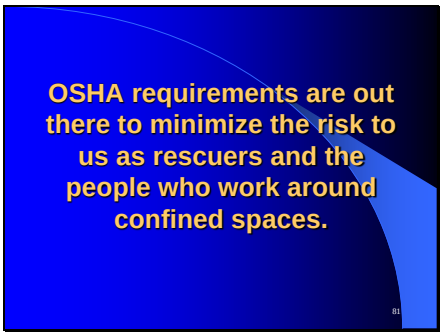

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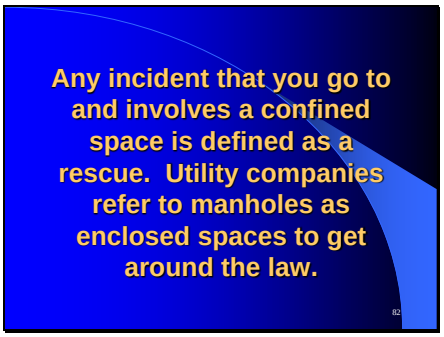

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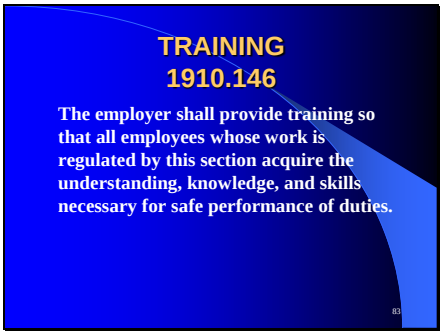

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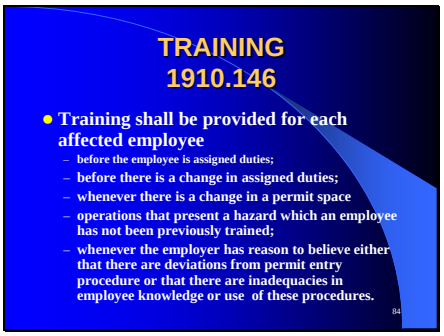

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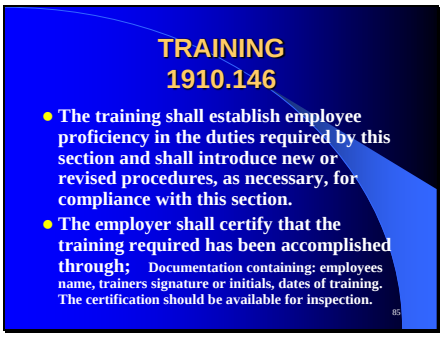

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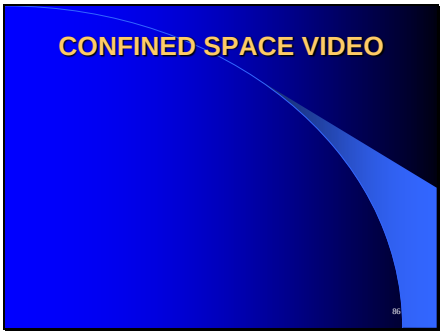

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